

- 1) A computer is an
 - (a) Electric device
 - (b) Electronic device
 - (c) Electrostatic device
 - (d) Electromagnetic device
- 2) History of computer starts with
 - (a) Napier's Bones
 - (b) Abacus
 - (c) Difference Engine
 - (d) Analytical Engine
- 3) Computer applications are
 - (a) Landing air planes
 - (b) Banking transactions
 - (c) Print of books
 - (d) All
- 4) Difference Engine was developed by.
 - (a) Blasé Pascal
 - (b) Charles Babbage
 - (c) Herman Hollerith
 - (d) Napier's Bone
- 5) History of computers starts about
 - (a) 2000 years ago
 - (b) 3000 years ago
 - (c) 4000 years ago
 - (d) 5000 years, ago
- 6) Computer processes data and converts it into
 - (a) Theory
 - (b) Information
 - (c) Hypothesis
 - (d) Observation
- 7) Napier's Bones and the slide rule were developed in.
 - (a) 17th Century
 - (b) 16th Century
 - (c) 18th Century
 - (d) 19th Century
- 8) Punch cards developed by
 - (a) Joseph Jacquard
 - (b) Howard H-Aiken
 - (c) Gottfrid
 - (d) Herman Hollerith
- 9) The slide rule was used till the middle
 - (a) 50's
 - (b) 60's
 - (c) 70's
 - (d) 80's
- 10) John Napier, Created Napier's Bones by using
 - (a) Bones
 - (b) Iron
 - (c) Rods
 - (d) Wires
- 11) Pascal's Pascaline calculator had a system of
 - (a) Gears
 - (b) Rods
 - (c) Slides
 - (d) Bones
- 12) Which German Mathematician, produced a machine similar to Pascal's.
 - (a) Von Leibniz
 - (b) Charles Babbage
 - (c) John Napier
 - (d) Herman Hollerith
- 13) Give the idea of Analytical Engine.
 - (a) Blaise Pascal
 - (b) Charles Babbage
 - (c) Herman Hollerith
 - (d) Napier's Bone
- 14) ENIAC was developed by.
 - (a) Howard H. Akin
 - (b) John Mauchly and J.P Eckert
 - (c) Charles Babbage
 - (d) None
- 15) Herman Hollerith developed
 - (a) Difference Engine
 - (b) Analytical Engine
 - (c) Punched card tabulator
 - (d) ENIAC
- 16) Babbage called his idea an
 - (a) Analytical Engine
 - (b) Electrical engine
 - (c) Electronic Engine
 - (d) Abacus
- 17) First electro-mechanical punched card tabulator was developed in
 - (a) 1822
 - (b) 1833
 - (c) 1890
 - (d) 1942
- 18) Difference Engine was developed in.
 - (a) 1723
 - (b) 1833
 - (c) 1823
 - (d) 1822
- 19) Analytical engine was developed by.
 - (a) John Mauchly
 - (b) Blaise Pascal
 - (c) John Neumann
 - (d) None
- 20) The first commercial computer was.
 - (a) UNIVAC-1
 - (b) Mark-1
 - (c) Abacus
 - (d) ENIAC

- 21) Which were the first commercially available computers?
(a) EDVAC (b) ENIAC (c) UNIVAC (d) Both a & c
- 22) In early 1950's which inventions changed the image of the computer field
(a) Magnetic core memories, transistor circuit Elements
(b) ICS, magnetic core memories
(c) Transistors, ICS
(d) Transistors, EDVAC
- 23) During 1950's and 1960's, computers were used in which fields?
(a) Accounting (b) Pay roll (c) Inventory control (d) All of these
- 24) VLSI stands for
(a) very low scale integration (b) very large central integration
(c) very low central Integration (d) very large scale integration
- 25) PCs were introduced in
(a) 1960's (b) 1970's (c) 1980's (d) 1990's
- 26) Advancement in technologies continue to produce computers which are
(a) Cheaper (b) Faster (c) Accurate (d) All of these
- 27) There are generations of computer.
(a) Four (b) Five (c) Six (d) Three
- 28) First Generation of computer used.
(a) Transistors (b) Vacuum Tubes (c) ICs (d) Processor
- 29) ENIAC, EDVAC and UNIVAC-1 were the generation computer.
(a) First (b) Second (c) Third (d) Fourth
- 30) Were used in 2nd generation computer.
(a) Transistors (b) Vacuum Tubes (c) ICs (d) Processor
- 31) IBM 1400 were the generation computers.
(a) First (b) Second (c) Third (d) Fourth
- 32) The third generation of computers used.
(a) ICs (b) Microchip (c) Vacuum Tube (d) Processor
- 33) IBM system/360 series were the generation computers.
(a) First (b) Second (c) Third (d) Fourth
- 34) Microprocessor was used in generation computers.
(a) 4th (b) 2nd (c) 3rd (d) 1st
- 35) Microcomputers are belonging to generation of computers.
(a) 4th (b) 2nd (c) 3rd (d) 1st
- 36) Computer can be into types
(a) Two (b) Three (c) Four (d) One
- 37) Hybrid computer is a mixture of computer.
(a) Digital (b) Analog (c) Both a & b (d) None
- 38) Digital computer can be classified into types.
(a) Three (b) Two (c) Four (d) One
- 39) Computers represents physical quantities like speed, weight.
(a) Digital (b) Analog (c) Hybrid (d) All
- 40) Are the first computers being developed?
(a) Analog (b) Digital (c) Hybrid (d) None
- 41) Analog clock, Analog Thermometer is the examples of computer.
(a) Digital (b) Analog (c) Hybrid (d) Super

- 42) The computer language that are closed to machine language are called.
 (a) Low Level Language (b) High Level Language
 (c) Assembly Language (d) Medium level
- 43) Fortran stands for.
 (a) Formula Translation (b) Formula Technique
 (c) Both a & b (d) None
- 44) LISP language is widely used for work.
 (a) AI (b) System programming
 (c) Application Programming (d) All
- 45) FORTRAN was developed in.
 (a) 1945 (b) 1957 (c) 1960 (d) 1967
- 46) C language is developed in early.
 (a) 1950's (b) 1960's (c) 1970's (d) 1980's
- 47) Assembler is used to convert language program into machine Language.
 (a) Assembly (b) HLL (c) Pascal (d) LLL
- 48) A computer cannot directly understand level language.
 (a) Low (b) High (c) Middle (d) None
- 49) Compiler is used to convert level language source code into machine language.
 (a) Low (b) High (c) Middle (d) None
- 50) Interpreter is used to convert high-level language program into language.
 (a) Machine (b) High (c) Middle (d) None

ANSWER KEY

1	B	11	A	21	C	31		41	B
2	B	12	A	22	A	32	A	42	A
3	D	13	B	23	D	33		43	A
4	B	14		24	D	34	A	44	A
5	D	15	C	25	B	35	A	45	B
6	B	16	A	26	D	36	B	46	C
7	A	17	C	27	B	37	C	47	A
8	D	18	D	28	B	38	D	48	B
9	C	19	D	29	A	39	D	49	B
10	C	20	B	30	A	40	A	50	A

KEEP VISITING

TOPSTUDYWORLD.COM

FOR 4 REASONS



1 NOTES

KIPS AND OTHER NOTES FOR
9TH, 10TH, 11TH AND 12TH CLASS

GREAT MARKS TIPS 2

GETTING 94 MARKS IN URDU,
AND PAPER ATTEMPTING,
ENTRY TEST, FSC EXAMS TIPS



3 BOARD NEWS AND POLICY

BOARD UPDATES, PAPER
IMPROVEMENT, CANCELLATION
POLICIES ETC IN EASY WORDS



FREE SUPPORT 4

ARE YOU BROKEN? ARE YOU
FINDING THE SOLUTION TO
YOUR PROBLEM? DO YOU WANT
TO KNOW ANYTHING RELATED
TO STUDY? WE WILL BE HAPPY
TO HELP YOU!



YOU ARE GOOD TO GO!

Stay safe

WEBSITE: WWW.TOPSTUDYWORLD.COM
FREE SUPPORT: [FB.COM/TOPSTUDYWORLD](https://fb.com/topstudyworld) &
CEO@TOPSTUDYWORLD.COM

SHORT QUESTIONS

Q.1 Define computer.

COMPUTER

"Computer is an electronic device which is used to store, retrieve and process the data according to the instructions given to it."

Q.2 What is data?

DATA

The collection of raw facts and figure is called data e.g. live I Lahore.

Q.3 What is information?

INFORMATION

The processed form of data is called information e.g. I live in Lahore.

Q.4 What is Abacus?

ABACUS

Abacus is a simple calculating device developed by Chinese 5000 years ago. It consists of wooden rack holding wires and each wire contains 9 beads.

Q.5 Write down the advancement of Napier's bones?

NAPIER'S BONES ADVANCEMENT

The famous logarithms idea was developed by John Napier a Scottish mathematicians. He created logarithm table for arithmetic calculations. He also developed a new device using rods, also called Napier Bones to perform arithmetic calculations.

Q.6 Who is called the father of computer? Why?

FATHER OF COMPUTER

Charles Babbage is called the father of computer because the modern computers are based upon the concept of Charles Babbage Analytical Engine.

Q.7 What is the contribution of Charles Babbage?

Or

Q. What do you know about Charles Babbage?

CHARLES BABBAGE

Charles Babbage was a mathematics professor. In 1822 he designed a automatic mechanical calculating machine which is called difference engine. In 1833 he gave the idea of Analytical engine which is fully programmed controlled mechanical digital computer.

Q.8 What is the calculating device of Pascal?

PASCAL PASCALINE CALCULATOR

Pascal invented the first mechanical calculating machine. This calculating machine consisted a series of wheels or gears each number from 0 to 9. this calculating machine perform arithmetic operations and displayed the number by rotation of different wheels or gears.

Q.9 What is punch card?

PUNCH CARD

In 1890, Herman Hollerith developed the first electro mechanical punched card tabulator. The tabulator could read information that had been punched into cards. Data were fed and results were produced on punched cards.

Q.10 What are the advantages of second generation computers?

**ADVANTAGES OF SECOND GENERATION
COMPUTERS**

The advantages of second generation computers are as follows

1. 200 transistors are about the same size as one vacuum tube in a computer.
2. Less expensive
3. 40 times faster than a vacuum tube
4. More reliable
5. Less electricity consumed

Q.11 What is the difference between first and second Generation computers?

DIFFERENCE BETWEEN FIRST AND SECOND GENERATION COMPUTERS

1 ST GENERATION	2 ND GENERATION
1. Vacuum tube technology was used	1. Transistor technology was used
2. These computers are fastest computers of their time.	2. These computers are 40 times faster than 1 st generation computers.
3. Large in size	3. Small in size
4. Small Storage capacity	4. More storage capacity
5. Unreliable	5. Reliable

Q.12 What is ENIAC?

ENIAC

ENIAC stands for Electronic Numerical Integrator and Calculator. It was the first general purpose electronic digital computer designed by John William Mauchly and John Eckert in 1946. The ENIAC was very heavy and large in size. It consumes 140 kilowatts of power and was capable of doing 5000 additions per second. ENIAC was a decimal rather than a binary machine.

Q.13 What is UNIVAC?

UNIVAC

UNIVAC stands for Universal Automatic Computer. In 1951, Eckert - Mauchly computer corporation developed the first UNIVAC. It was the first computer developed for commercial use. UNIVAC could work 24 hours a day.

Q.14 What is the difference between Analog and Digital computers?

**DIFFERENCE BETWEEN ANALOG AND DIGITAL
COMPUTERS**

ANALOG	DIGITAL
1. These computers provide us continuous information.	1. These provide us discrete information
2. These computers have no state	2. These computers have two states ON and OFF.
3. These computers are unreliable	3. These computers are reliable
4. These computers are difficult to use	4. These computers are easy to use
5. These computers are easy to developed.	5. These computers are difficult to developed.
6. These computers have small memory.	6. These computers have large memory.
7. Thermometer, weight machine, speedometer is an example of analog devices.	7. These computers have fast speed. Digital watch, petrol station is an example of digital devices.

Q.15 What are Analog computers?

ANALOG COMPUTERS

"The computers which provide us continuous information are called Analog computers" Analog computers represent physical quantities in the form of waves or in continuous form. The analog computers accept input and give out put in the form of analog signals.

Q.16 What are Digital computers?

DIGITAL COMPUTERS

"The computers which present physical quantities with the help of symbols or numbers and provide us discrete information are called digital computers."

The digital computer performs arithmetic and logical operations with discrete values. The digital computers are mostly used for solving mathematical problems and to manipulate numbers.

Q.17 What are Hybrid computers?

HYBRID COMPUTERS

The hybrid computer which has the best features of both Analog and Digital computers. Hybrid computer use analog to digital conversion and digital to analog conversion, and many input or output either Analog or Digital data.

Q.18 What is Super computer?

SUPER COMPUTER

Super computers are the largest, fastest and most expensive computer system in the world. These computers are used to perform complex processing tasks. It can perform 1 trillion calculations per second. Supercomputers have thousands of microprocessors. CRAY T90 is an example of super computer.

Q.19 What is Mainframe computer?

MAINFRAME COMPUTER

Mainframe computers are the largest type of computers. These computers are used in large organizations like banks, insurance companies where people need frequent access to the same data. These computers used in network environment. IBM/390 is an example of mainframe computers.

Q.20 What is Mini computer?

MINI COMPUTER

Mini computers are small in size. Mini computers have less processing power than mainframe computers but have high processing power than microcomputers. HP 3000 is an example of mini computers.

Q.21 What is Micro computer?

MICRO COMPUTER

These computers are known as personal computers. These computers are developed for individual users. These computers have low storage capacity, inexpensive and easy to use. IBM-PC is an example of micro computers.

Q.22 What is Pocket computer?

POCKET COMPUTER

Pocket computers are small in size and it is designed to keep a lot of information close to hand. Pocket computer has small batteries and a special operating system. Special pens or touch sensitive screen is used to enter the data.

Q.23 What is Laptop computer?

LAPTOP COMPUTER

Laptop computer is also called a note book. It is small in size, due to its size it can be easily move from one place to another. Like desktop computer laptop computers also used the same operating system and all software's which are used in desktop computers. It also have CD-ROM, DVD drives etc. It is more expensive than desktop computers.

Q.24 What is computer program?

PROGRAM

The set of instructions to solve any kind of problem is called computer program.

Q.25 What is high level language?

HIGH LEVEL LANGUAGE

A language which is close to human beings and far from computer is known as high level language. A high level language is based on English like words. It is easy to understand and learn. Fortran, COBOL and PASCAL is an example of high level language.

Q.26 What is low level language?

LOW LEVEL LANGUAGE

A language which is close to computers and far from human beings is known as low level language. A low level language is based on 0 and 1. A computer can easily understand it. Assembly and machine language is an example of low level language.

Q.27 What is Assembly language?

ASSEMBLY LANGUAGE

Assembly language is also called the low level language. In assembly language special codes are used instead of binary numbers. These codes are called mnemonic codes. For example **ADD** is a mnemonic code which is used for add the numbers or **HLT** code is used to stop processing.

Q.28 What is the difference between High level languages and Low level languages?

DIFFERENCE BETWEEN HIGL LEVEL AND LOW LEVEL LANAUGAGE

High Level Language	Low Level Language
1. High level language is close to human.	1. Low level language is close to computer.
2. High level language is easy to understand	2. Low level language is difficult to understand
3.High level language is machine independent	3. Low level language is machine dependent.
4.High level language consist English like words	4. Low level language consist binary numbers 0's and 1's

Q.29 What is language processor or translator?

LANGUAGE PROCESSOR

A language processor is used to translate high level language into machine language or low level language. There are three types of language processors.

- 1) Assembler
- 2) Compiler
- 3) Interpreter

Q.30 What is Assembler?

ASSEMBLER

Assembler is a program which is used to translate assembly language program into machine code.

Q.31 What is Compiler?

COMPILER

Compiler is a program to translate the source code into machine language as a whole before executing it.

Q.32 What is Interpreter?

INTERPRETER

Interpreter is a program which is used to convert the source code into machine language line by line.

Q.33 What is Mnemonic code?

MNEMONIC CODE

The codes or symbols which are used in assembly language is called mnemonic code. For example **ADD** is a mnemonic code which is used for add the numbers or **HLT** code is used to stop processing.

Q.34 What is source code?

SOURCE CODE

A program which is written in high level language is called source code or source program.

Q.35 What is object code?

OBJECT CODE

A program which is written in low level language is called object code or object program.

Q.36 What is the difference between source code and object code?

DIFFERENCE BETWEEN SOURCE AND OBJECT CODE

Source Code	Object Code
1. Source code is written in high level language	1. Object code is written in low level language
2. Source code is easy to understand	2. Object code is difficult to understand
3. Source code is easy to modify	3. Object code is difficult to modify

Q.37 What is the difference between compiler and interpreter?

DIFFERENCE BETWEEN COMPILER AND INTERPRETER

Compiler	Interpreter
1. Compiler translate the program into low level language as a whole	1. Interpreter translate the language into low level language line by line
2. Compiler save the object code	2. Interpreter does not save the object code.
3. Compile once and execute many times	3. Interpreter compile the program every time of execution
4. Program execution is fast	4. Program execution is slow.

LONG QUESTIONS

Q.1 What is computer generation? Explain it.

COMPUTER GENERATION

The term Generation indicates the type of technology used in the design and construction of the computer. The design and construction of computers changed with the passage of time. As new technology emerged, it was used in the making of computers. The computer improved in speed, accuracy and storage capacity. These changes in technology are recognized as computer generations.

There are five computer generations. These are

1. First Generation
2. Second Generation
3. Third Generation
4. Fourth Generation
5. Fifth Generation

FIRST GENERATION

First generation computers vacuum tubes technology was use. Vacuum tube was a device that could control and amplify electronic signals.

ADVANTAGES

1. Vacuum tubes were the only electronic components available
2. Vacuum tube technology made possible the advent of electronic digital computer.
3. These computers were the fastest calculating device of their time.

DISADVANTAGES

1. Large in size
2. Unreliable
3. Thousand of vacuum tubes were produced large amount of heat and burn out
4. Air condition rooms are required
5. Regular maintenance is required
6. Not portable
7. It consume electricity in large amount
8. Expensive

EXAMPLE

ENIAC and UNIVAC is an example of first generation computers.

SECOND GENERATION

Transistor technology was used in second generation computers. Transistors were developed by William Shockely, John Bardeen and William Brattain. These computers were smaller in size, faster and more reliable as compared to first generation computers.

ADVANTAGES

1. 200 transistors are about the same size as one vacuum tube in a computer.
2. Less expensive
3. 40 times faster than a vacuum tube
4. More reliable
5. Less electricity consumed
6. Less heat is generated

DISADVANTAGES

1. Air condition rooms are required
2. Regular maintenance is required

EXAMPLE

IBM 7094 series, IBM 1400 series, CDC 164 is an example of second generation computers.

THIRD GENERATION

IC technology was used in third generation computers. The concept of IC was developed by Jack St. Clair Kilby in 1958 and it was developed in 1961. The size of IC was $\frac{1}{4}$ square inch.

ADVANTAGES

1. Smaller in size as compared to previous generation computers.
2. More reliable than second generation computers
3. Easily portable
4. Less electricity consumed
5. Lower in price

DISADVANTAGES

1. Air condition rooms are required
2. Highly difficult technology required for manufacture of IC

EXAMPLE

IBM system 360, DEC, PDP is an of third generation computers.

FOURTH GENERATION

In this generation IC's were replaced with microprocessor chip. The first microprocessor chip was developed in 1971 by Ted Hoff for Intel, which was named as Intel 4004. The size of modern microprocessor is less than one inch square and can contain million of electronic circuits.

ADVANTAGES

1. Small in size
2. Low in cost
3. Very high processing speed
4. Heat generated is small
5. Easily portable
6. Large storage memory
7. Very reliable

DISADVANTAGES

1. Highly difficult technology is required for the manufacturing of microprocessor chip.

EXAMPLE

Apple Macintosh and IBM PC is an example of fourth generation computers.

FIFTH GENERATION

Fifth generation computer devices are based on artificial intelligence, are still in development. Some applications such as voice recognition that are being used today. The computers of fifth generation will be able to think and to make decisions like human beings.

ADVANTAGES

1. Ability to think
2. Ability to make decisions
3. Parallel processing
4. Extremely high speed
5. Very large memory

Q.2 Write a note on types of computers?

Computers can also be divided into three categories depending upon their construction and form of input data they can accept an process. These are

1. Analog computers
2. Digital Computers
3. Hybrid Computers

1. ANALOG COMPUTERS

"The computers which provide us continuous information are called Analog computers"

Analog computers represent physical quantities in the form of waves or in continuous form. The analog computers accept input and give out put in the form of analog signals.

CHARACTERISTICS OF ANALOG COMPUTERS

The characteristics of analog computers are as follows

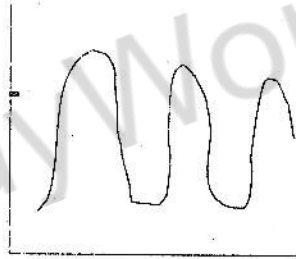
1. These computers have no state
2. These computers are not reliable.
3. These computers became the base of digital computers.
4. These computers are difficult to operate and use.
5. The speed of analog computer is fast.
6. These computers are easy to develop.
7. These computers have small memory.

EXAMPLE

Thermometer is the example of analog computers because it measure the length of a mercury column continuously.

A traditional clock is the example of analog computers because the needle of clock covers the distance of dial continuously.

DIAGRAM



The above diagram shows that an analog system is working continuously as the waves is moving continuously.

2. DIGITAL COMPUTERS

"The computers which present physical quantities with the help of symbols or numbers and provide us discrete information are called digital computers."

The digital computer perform arithmetic and logical operations with discrete values. The digital computers are mostly used for solving mathematical problems and to manipulate numbers.

CHARACTERISTICS OF DIGITAL COMPUTERS

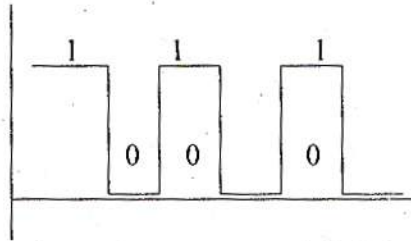
The characteristics of digital computers are as follows

1. Digital computers have two states ON and OFF
2. These computers are easy to use
3. Digital computers are reliable
4. High processing speed
5. Large storage capacity

EXAMPLE

IBM PC, Apples Macintosh is an example of digital computers

DIAGRAM



The above diagram shows the two states of digital computers.

3. HYBRID COMPUTERS

The hybrid computer which has the best features of both Analog and Digital computers. Hybrid computer use analog to digital conversion and digital to analog conversion, and many input or output either Analog or Digital data.

CHARACTERISTICS OF HYBRID COMPUTERS

The characteristics of hybrid computers are as follows

1. These computers are reliable and accurate
2. These computers are fast
3. It can process continuous and discrete type of data

EXAMPLE

In ICU of hospital Hybrid computers are used. The analog quality of these computers control the temperature of the room. Whereas digital quality inform the doctor about the blood pressure temperature and physical status of patient.

Q.3 Write a note on Classification of computers?

Computers are divided in four classes according to their size

1. Super Computers
2. Mainframe Computers
3. Mini Computers
4. Micro Computers

1. SUPER COMPUTERS

Super computers are the largest, fastest and most expensive computer system in the world. These computers are used to perform complex processing tasks.

CHARACTERISTICS OF SUPER COMPUTER

The characteristics of super computer are

1. It can perform 1 trillion calculations per second.
2. It can house thousands of processors.
3. Supercomputers can cost tens of millions of dollars.
4. It consumes electricity which can consume by dozens of home.

AREAS OF APPLICATION

Major areas of supercomputers are

1. Weather forecasting
2. Nuclear research

EXAMPLE

CRAY T90, CRAY 1, ETA is an example of supercomputer

2. MAINFRAME COMPUTERS

Mainframe computers are the largest type of computers. These computers are used in large organizations. These computers generally supports 500 to 2000 local and remote users.

CHARACTERISTICS OF MAINFRAME COMPUTER

The characteristics of mainframe computers are

1. A large number of peoples can use the same computer at the same time.
2. Air condition and dust free room is required.
3. Qualified operators and programmers are required
4. They have large storage capacity.
5. It can support thousand of terminals.

AREAS OF APPLICATION

Major areas of Mainframe computers are

1. Banks
2. Airlines
3. Insurance companies
4. Government organizations

EXAMPLE

IBM S/390, IBM 370 is an example of mainframe computers.

3. MINI COMPUTERS

Mini computers are small in size. Mini computers have less processing power than mainframe computers but have high processing power than microcomputers.

CHARACTERISTICS OF MINI COMPUTER

The characteristics of mini computers are

1. Mini computers are used in network environment as server machine.
2. Mini computers can support number of users, input and output requirements.
3. Air condition room is not necessary
4. 10 to 200 persons can work on it simultaneously.

AREAS OF APPLICATION

Major areas of Mini computers are

1. Engineering and scientific research
2. Time sharing services

EXAMPLE

HP 3000 is an example of mini computers.

4. MICRO COMPUTERS

These computers are used now a days commonly. These computers have revolutionized the computer industry because of their size and cost.

CHARACTERISTICS OF MICRO COMPUTER

The characteristics of micro computers are

1. Micro computers are less expensive
2. Low storage capacity
3. Only one person can be used
4. Hard disk and floppy disk is used to store the data
5. Monitor and printer is used to produce the output

AREAS OF APPLICATION

Major areas of Micro computers are

1. Business
2. Education
3. Industry
4. Homes

FORTRAN

FORTRAN stands for Formula Translation. It was developed in 1957 by John Backus. It was mainly used for scientific purpose. It is a simple and easy high level language.

BASIC

BASIC stands for Beginners All purpose Symbolic Instructions Code. It was developed in 1964 by John Kemeny and Thomas Kurtz. It is a simple high level language and normally used for beginners (students) to learn computer programming.

The designing principles of BASIC are

1. Be easy for beginners to use
2. Be a general purpose language
3. Be interactive
4. Provide clear and friendly error messages.
5. Respond fast for small programs
6. No understanding of computer hardware

COBOL

COBOL stands for Common Business Oriented Language. It was in 1959. It was specially developed for business and commercial applications. It was normally used for payroll, inventory and stock systems. It is a simple and easy high level language.

LISP

LISP stands for List Programming. It was designed for Artificial Intelligence research. The programming rules of this language are different from ordinary high level language. It has the ability to modify itself. It is used to develop computer games.

PASCAL

The language was named after the name of Blasé Pascal who was a famous French mathematician. It was developed by Professor Nicluas. It has the best features of COBOL, FORTRAN and ALGOL language. The combination of features, input/output and solid mathematical features, made it a highly successful language.

C AND C++

C language was developed by Dennis Ritchie in 1972 while working at Bell Labs. It is commonly used in system programming and compiler writing. A very popular operating system UNIX was developed in C language.

C++ was an extension of C. The syntax of C++ is similar to C language. The main feature of C++ is that it is an object oriented language. It is most popular language in the field of computer science.

VISUAL BASIC

Visual Basic was the first visual development tool developed by Microsoft. At the beginning, it was not so popular. It became popular in market when Microsoft released VB 3.0. Now Visual Basic is very popular in the programming field. Most of the Windows based applications are developed in Visual Basic. It means that GUI applications are developed in this language.

JAVA

Java was developed by Sun Microsystems. It was specially designed to control microprocessors used in cable receivers, VCRs and also for PDA (Personal Data Assistants). This language has powerful capabilities of network programming Internet applications and GUI.

EXAMPLE

IBM-PC is an example of micro computers.

Q.4 What is computer language? Explain its different types.

COMPUTRE LANGUAGE

A computer language is a means of communication between a user and the computer.

These languages are use to develop computer software.

TYPES OF COMPUTER LANUGAGES

There are two types of languages

1. LOW LEVEL LANUGUAGE

2. HIGH LEVEL LANGUAGE

1. LOW LEVEL LANGUAGE

Low level language is close to computer but far from the human beings. A computer can easily understand these languages. These languages are difficult to understand for human beings only experienced programmers can understand these languages. There are two types of low level language.

TYPES OF LOW LEVEL LANGUAGE

i. MACHINE LANGUAGE

ii. ASSEMBLY LANGUAGE

i. MACHINE LANGUAGE

Machine language is consist of binary numbers 0 and 1. It is a fundamental language of the computer. Computer understand this language easily without translation. The program instructions are written in machine language by using the series of binary numbers. It is very difficult and complex as well as time consuming to write a program. If there is any error in program then it become very difficult to detect it.

ii. ASSEMBLY LANGUAGE

Assembly language is used to make the programming easier. In assembly language special symbols are used for instructions. These codes are called mnemonic codes. So that's why assembly language is also called symbolic language. For example **ADD** is a mnemonic code which is used for add the numbers or **HLT** code is used to stop processing. A computer can not understand these codes so assembler is used to convert the assembly language into machine code.

2. HIGH LEVEL LANGUAGE

A language which is close to human beings but far from the computer is called the high level language. It consists on English like words. We can learn and understand these languages easily. Special type of software's compiler and interpreter is required to translate high level language into machine language. FORTRAN, COBOL, PASCAL, C and VB is an example of high level languages.

Q.5 Briefly describe the different high level languages.

Some common high level languages are

1. FORTRAN
 2. BASIC
 3. COBOL
 4. LISP
 5. PASCAL
 6. C & C++
 7. VISUAL BASIC
 8. JAVA
-

Q.6 Describe the applications of computers in different fields.

EDUCATION

Educational institutes, from primary to university level, are using computers for various learning activities. A large number of learning programs (tutorials) are available on almost every subject. The trend of conducting online examinations is getting popular e.g. GRE, GMAT, SAT etc. are conducted online through out the world. questions are marked by the computer, which minimize the chance of committing mistakes. It also makes it possible to announce results in time.

Distance learning is a new learning methodology. Computer plays the key role in this type of learning. Hundreds of institutes are offering distance-learning programs. The students are not required to come to the institute whereas they are provided reading material and attend classes via **virtual classroom**. In a virtual classroom, the teacher delivers lecture at his own workplace while the students, connected to a network, may listen to him at their homes. They may put questions and answers are sent to them via email.

BUSINESS

Computer is now being used in business and industry. Computer information systems are used to keep track of huge transactions. These are also used to control machines which manufacture products, keep track of customer's bills, analyze sales of various products in different localities on monthly and yearly basis; calculating and recording employ pays and performs various other tasks.

ONLINE BANKING

Today banks are the largest users of computers. In banks, powerful computers are used to perform millions of transactions. All branches of banks are connected through computer network. Nowadays, ATMs are installed everywhere; these are all computerized and connected together. These can be used to draw money from any branch of that bank at any time of the day. Customers are now also connected to the bank via personal computers, which allows them to see their bank account status at home.

ADVANTAGES OF ONLINE BANKING

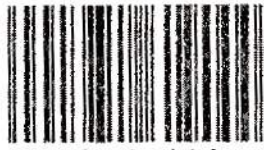
Following are some of the advantages of online banking

- **Convenience** Computerized online banking sites never close; they're available 24 hours a day, seven days a week, and they can be accessed from a computer.
- **Ubiquity** If you're out of the country and a money problem arises, you can draw money to your online bank.
- **Transaction speed** The online banks transactions speed is very high.
- **Efficiency** You can access and manage all of your bank accounts, from one site.

APPLICATION IN RETAILING APPLICATIONS

Modern stores are quickly incorporating computer system for a number of reasons. Firstly these systems allow the billing of items to be done at great speed. They accept credit cards, allowing customer to purchase goods without cash.

The items at store are marked with 'Bar Code'. This is called as 'Universal Production Code'. This is sequence of line, which is read by a 'Bar Code Reader'. the price of the item is stored in this code and these are automatically added to the bill. The computer generated the receipt and the customer pays the bill.



1971 619

Figure iii Universal Production Code

ENTERTAINMENT

The advancement of computer science has also helped entertainment industry.

1. Now a days computer can be used to watch television shows being broadcasted on internet, watch movies, listen to music and play games.
 2. Computers are also used to create animations and special effects for television shows, commercials, movies and cartoons. These allow them to add graphics and colorful displays in their shows.
 3. Computer games also becoming a big attraction for children and kids.
- Computer is also being used by music industry to create high quality music and sounds in less amount of time.

Use Of Computer Simulation

Computer Simulation is the use of computer to represent the dynamic responses of a system by the change in behaviors of another system modeled after it. Computer simulations are widely used in educational institutes to make clear the understanding of the working of various systems e.g.

1. Simulation of aero plane is a part of training of the pilot. It makes him /her clear the working of various parts of aero plane.
2. Simulation of river systems can be manipulated to determine the potential effects of dams, and irrigation network before any actual construction has taken place.
3. In educational institute's, simulations also have advantages over hands-on laboratory work such as allowing students to do more complicated and hazardous experiments, obtain results more quickly, and get a deeper understanding of the experiments.

OTHER AREAS

Today computers are being used in many other areas to save time and cost. These include publishing where documents can be written and saved on a computer. This is accomplished by a word-processing application such as Microsoft Word. These applications allow the writers to, correct and print the document in very short time. These documents can also be sent from one place to another via Internet.

EXERCISE

Q.1 Describe Charles Babbage work in the history of computers?

Charles Babbage was British Mathematician at Cambridge University. In 1822, he design an automatic calculating machine which he called difference engine. It was intended to be steam powered and fully automatic including the printing of the results.



In 1833, Charles Babbage designed the first programmable machine called Analytical Engine. He could not construct this engine in his life. But his design gave ideas for the research in the field of computers. The most of modern computers are made on the principle of Babbage. That is why he is called the father of modern computer.

Q.2 Describe the advancements in the computers during 1950's and 1960's?

Advancement in 1950's - 1960's

In early 1950's, two important engineering inventions changed the image of the computer field. These inventions were the magnetic core memories and the Transistor Circuit Elements. This quickly found its way into new models of digital computers.

These machines were very expensive and were also complicated to operate. Such computers were mostly found in large computer centers, government, and research and development laboratories. Those computers mostly worked on a single problem at a time.

COMPUTER ACCESSORIES

During this period, the major computer manufacturers began to offer a range of computer equipment with different prices, as well as accessories such as

- Card Readers
- Printers
- Cathode-Ray-Tube

COMPUTER IN BUSINESS

These were widely used in businesses for such things as

- Accounting
- Payroll
- Inventory Control
- Ordering Supplies
- Billing

Q.3 Write a note on different computer generations. Briefly explaining their features.

There are five computer generations. These are

1. First Generation
2. Second Generation
3. Third Generation
4. Fourth Generation
5. Fifth Generation

1. FIRST GENERATION

First generation computers vacuum tubes technology was use. Vacuum tube was a device that could control and amplify electronic signals.

FEATURES

1. Vacuum tubes were the only electronic components available
2. Vacuum tube technology made possible the advent of electronic digital computer.
3. These computers were the fastest calculating device of their time.

EXAMPLE

ENIAC and UNIVAC is an example of first generation computers.

2. SECOND GENERATION

Transistor technology was used in second generation computers. Transistors were developed by William Shockely, John Bardeen and William Brattain. These computers were smaller in size, faster and more reliable as compared to first generation computers.

FEATURES

1. 200 transistors are about the same size as one vacuum tube in a computer.
2. Less expensive
3. 40 times faster than a vacuum tube
4. More reliable
5. Less electricity consumed
6. Less heat is generated

EXAMPLE

IBM 7094 series, IBM 1400 series, CDC 164 is an example of second generation computers.

3. THIRD GENERATION

IC technology was used in third generation computers. The concept of IC was developed by Jack St. Clair Kilby in 1958 and it was developed in 1961. The size of IC was $\frac{1}{4}$ square inch.

FEATURES

1. Smaller in size as compared to previous generation computers.
2. More reliable than second generation computers
3. Easily portable
4. Less electricity consumed
5. Lower in price

EXAMPLE

IBM system 360, DEC, PDP is an of third generation computers.

4. FOURTH GENERATION

In this generation IC's were replaced with microprocessor chip. The first microprocessor chip was developed in 1971 by Ted Hoff for Intel, which was named as Intel 4004. The size of modern microprocessor is less than one inch square and can contain million of electronic circuits.

FEATURES

1. Small in size
2. Low in cost
3. Very high processing speed
4. Heat generated is small
5. Easily portable
6. Large storage memory
7. Very reliable

EXAMPLE

Apple Macintosh and IBM PC is an example of fourth generation computers.

5. FIFTH GENERATION

Fifth generation computer devices are based on artificial intelligence, are still in development. Some applications such as voice recognition that are being used today. The computers of fifth generation will be able to think and to make decisions like human beings.

FEATURES

1. Ability to think
2. Ability to make decisions
3. Parallel processing
4. Extremely high speed
5. Very large memory

Q.4 What is the difference between Analog and Digital computers?

**DIFFERENCE BETWEEN ANALOG AND DIGITAL
COMPUTERS**

ANALOG	DIGITAL
1. These computers provide us continuous information.	1. These provide us discrete information
2. These computers have no state	2. These computers have two states ON and OFF.
3. These computers are unreliable	3. These computers are reliable
4. These computers are difficult to use	4. These computers are easy to use
5. These computers are easy to developed.	5. These computers are difficult to developed.
6. These computers have small memory.	6. These computers have large memory.
7. Thermometer, weight machine, speedometer is an example of analog devices.	7. These computers have fast speed. Digital watch, petrol station is an example of digital devices.

Q.5 Write short notes on the following?

- a. Pocket Computers
- b. Laptop Computers
- c. Micro Computers

POCKET COMPUTERS

Pocket computers are small in size and it is designed to keep a lot of information close to hand. Pocket computer has small batteries and a special operating system. Special pens or touch sensitive screen is used to enter the data.

LAPTOP COMPUTERS

Laptop computer is also called a note book. It is small in size, due to its size it can be easily move from one place to another. Like desktop computer laptop computers also used the same operating system and all software's which are used in desktop computers. It also have CD-ROM, DVD drives etc. It is more expensive than desktop computers.

MICRO COMPUTERS

8. Microcomputers are also referred to as personal computers (PCs). These are typical developed for individual users. These are less powerful machines as compared to minicomputers. The microcomputers are very popular due to its low price. PCs are becoming powerful day by day because of the improvement in technology. Microcomputers are commonly used in almost every field of life such as at homes, small offices, business, education etc.

Q.6 Describe the impact of computers and internet on society. -

OR

Q.7 Briefly name and describe some of applications of computers.

EDUCATION

Educational institutes, from primary to university level, are using computers for various learning activities. A large number of learning programs (tutorials) are available on almost every subject. The trend of conducting online examinations is getting popular e.g. GRE, GMAT, SAT etc. are conducted online through out the world. questions are marked by the

computer, which minimize the chance of committing mistakes. It also makes it possible to announce results in time.

Distance learning is a new learning methodology. Computer plays the key role in this type of learning. Hundreds of institutes are offering distance-learning programs. The students are not required to come to the institute whereas they are provided reading material and attend classes via **virtual classroom**. In a virtual classroom, the teacher delivers lecture at his own workplace while the students, connected to a network, may listen to him at their homes. They may put questions and answers are sent to them via email.

BUSINESS

Computer is now being used in business and industry. Computer information systems are used to keep track of huge transactions. These are also used to control machines which manufacture products, keep track of customer's bills, analyze sales of various products in different localities on monthly and yearly basis; calculating and recording employ pays and performs various other tasks.

ONLINE BANKING

Today banks are the largest users of computers. In banks, powerful computers are used to perform millions of transactions. All branches of banks are connected through computer network. Nowadays, ATMs are installed everywhere; these are all computerized and connected together. These can be used to draw money from any branch of that bank at any time of the day. Customers are now also connected to the bank via personal computers, which allows them to see their bank account status at home.

ADVANTAGES OF ONLINE BANKING

Following are some of the advantages of online banking

- **Convenience** Computerized online banking sites never close; they're available 24 hours a day, seven days a week, and they can be accessed from a computer.
- **Ubiquity** If you're out of the country and a money problem arises, you can draw money to your online bank.
- **Transaction speed** The online banks transactions speed is very high.
- **Efficiency** You can access and manage all of your bank accounts, from one site.

APPLICATION IN RETAILING APPLICATIONS

Modern stores are quickly incorporating computer system for a number of reasons. Firstly these systems allow the billing of items to be done at great speed. They accept credit cards, allowing customer to purchase goods without cash.

The items at store are marked with 'Bar Code'. This is called as 'Universal Production Code'. This is sequence of line, which is read by a 'Bar Code Reader'. the price of the item is stored in this code and these are automatically added to the bill. The computer generated the receipt and the customer pays the bill.



Figure. Universal Production Code

ENTERTAINMENT

The advancement of computer science has also helped entertainment industry.

1. Now a days computer can be used to watch television shows being broadcasted on internet, watch movies, listen to music and play games.
2. Computers are also used to create animations and special effects for television shows, commercials, movies and cartoons. These allow them to add graphics and colorful displays in their shows.
3. Computer games also becoming a big attraction for children and kids.
4. Computer is also being used by music industry to create high quality music and sounds in less amount of time.

Use Of Computer Simulation

Computer Simulation is the use of computer to represent the dynamic responses of a system by the change in behaviors of another system modeled after it. Computer simulations are widely used in educational institutes to make clear the understanding of the working of various systems e.g.

1. Simulation of aero plane is a part of training of the pilot. It makes him /her clear the working of various parts of aero plane.
2. Simulation of river systems can be manipulated to determine the potential effects of dams, and irrigation network before any actual construction has taken place.
3. In educational institute's, simulations also have advantages over hands-on laboratory work such as allowing students to do more complicated and hazardous experiments, obtain results more quickly, and get a deeper understanding of the experiments.

OTHER AREAS

Today computers are being used in many other areas to save time and cost. These include publishing where documents can be written and saved on a computer. This is accomplished by a word-processing application such as Microsoft Word. These applications allow the writers to, correct and print the document in very short time. These documents can also be sent from one place to another via Internet.

Q.7 Define computer. Briefly describe classification of computers?

DEFINITION

"Computer is an electronic device which is used to store, retrieve and process the data according to the instructions given to it."

CLASSIFICATION OF COMPUTERS

Computers are divided in four classes according to their size

1. Super Computers
2. Mainframe Computers
3. Mini Computers
4. Micro Computers

1. SUPER COMPUTERS

Super computers are the largest, fastest and most expensive computer system in the world. These computers are used to perform complex processing tasks.

CHARACTERISTICS OF SUPER COMPUTER

The characteristics of super computer are

1. It can perform 1 trillion calculations per second.
2. It can house thousands of processors.
3. Supercomputers can cost tens of millions of dollars.
4. It consumes electricity which can consume by dozens of home.

AREAS OF APPLICATION

Major areas of supercomputers are

1. Weather forecasting
2. Nuclear research

EXAMPLE

CRAY T90, CRAY 1, ETA is an example of supercomputer

2. MAINFRAME COMPUTERS

Mainframe computers are the largest type of computers. These computers are used in large organizations. These computers generally supports 500 to 2000 local and remote users.

CHARACTERISTICS OF MAINFRAME COMPUTER

The characteristics of mainframe computers are

1. A large number of peoples can use the same computer at the same time.
2. Air condition and dust free room is required.
3. Qualified operators and programmers are required
4. They have large storage capacity.
5. It can support thousand of terminals.

AREAS OF APPLICATION

Major areas of Mainframe computers are

1. Banks
2. Airlines
3. Insurance companies
4. Government organizations

EXAMPLE

IBM S/390, IBM 370 is an example of mainframe computers.

3. MINI COMPUTERS

Mini computers are small in size. Mini computers have less processing power than mainframe computers but have high processing power than microcomputers.

CHARACTERISTICS OF MINI COMPUTER

The characteristics of mini computers are

1. Mini computers are used in network environment as server machine.
2. Mini computers can support number of users, input and output requirements.
3. Air condition room is not necessary
4. 10 to 200 persons can work on it simultaneously.

AREAS OF APPLICATION

Major areas of Mini computers are

1. Engineering and scientific research
2. Time sharing services

EXAMPLE

HP 3000 is an example of mini computers.

4. MICRO COMPUTERS

These computers are used now a days commonly. These computers have revolutionized the computer industry because of their size and cost.

CHARACTERISTICS OF MICRO COMPUTER

The characteristics of micro computers are

1. Micro computers are less expensive
2. Low storage capacity
3. Only one person can be used
4. Hard disk and floppy disk is used to store the data
5. Monitor and printer is used to produce the output

AREAS OF APPLICATION

Major areas of Micro computers are

1. Business
2. Education
3. Industry
4. Homes

EXAMPLE

IBM-PC is an example of micro computers.

Q.8 Modern computers are based on stored program concept? Who introduces the concept? Discuss his/ her contribution in the history of computers.

Von Neumann's Idea About Stored Program

In 1945, John Von Neumann, a mathematician gave an idea that a computer should have a very simple, fixed physical structure, and yet be able to perform any kind of computation without the need for any physical change in the unit. He also gave idea how practical and fast computers should be built. Von Neumann idea usually referred to as the stored-program technique.

According to Von Neumann theory "data and program can be stored in the same memory. Thus the machine can itself alter either its program or data".

The Von Neumann theory was universally adopted. So the computing and programming became much faster and efficient. This theory also became essential for future generation of high-speed digital computers.

The first commercially available computers that used the Von Neumann's idea of stored programs were EDVAC (Electronic Discrete Variable Automatic Computer) and UNIVAC (Universal Automatic Computer).

Q.10 What is the difference between Low level and High level language?

DIFFERENCE BETWEEN HIGH LEVEL AND LOW LEVEL LANGUAGE

High Level Language	Low Level Language
1. High level language is close to human.	1. Low level language is close to computer.
2. High level language is easy to understand	2. Low level language is difficult to understand
3. High level language is machine independent	3. Low level language is machine independent.
4. High level language consist English like words	4. Low level language consist binary numbers 0's and 1's

Q.11 Discuss some negative aspects of the use of the internet in our society?

1. There are many negative aspects of using internet. Some one of them are given below.
2. Most of children's use different web sites without knowing the moral values. That's why it creates an immoral aspect of life and become corrupt.
3. Many people hack the computer and send meaning less messages.
4. Many people sell their low quality products with high prices.
5. Many students do not give proper time to their studies. They waste their time on internet.

Q.12 What is compiler and interpreter?

COMPILER

Compiler is a program to translate the source code into machine language as a whole before executing it.

INTERPRETER

Interpreter is a program which is used to convert the source code into machine language line by line.

Q.13 Write a note on the following

- a) Visual Basic b) LISP c) C / C++

VISUAL BASIC

Visual Basic was the first visual development tool developed by Microsoft. At the beginning, it was not so popular. It became popular in market when Microsoft released VB 3.0. Now Visual Basic is very popular in the programming field. Most of the Windows based applications are developed in Visual Basic. It means that GUI applications are developed in this language.

LISP

LISP stands for List Programming. It was designed for Artificial Intelligence research. The programming rules of this language are different from ordinary high level language. It has the ability to modify itself. It is used to develop computer games.

C

C language was developed by Dennis Ritchie in 1972 while working at Bell Labs. It is commonly used in system programming and compiler writing. A very popular operating system UNIX was developed in C language.

C++

C++ was an extension of C. The syntax of C++ is similar to C language. The main feature of C++ is that it is an object oriented language. It is most popular language in the field of computer science.

Q.14 Fill in the Blank.

1. Data
2. Digital
3. Stored Program
4. IBM
5. Hybrid
6. Personal Computer
7. IC
8. Electronic Numerical Integrator and Calculator
9. Supercomputer
10. High level language

Q.15 True or False

- | | | | | | |
|--------|---------|--------|-------|-------|-------|
| i) T | ii) F | iii) T | iv) T | v) F | vi) F |
| vii) T | viii) T | ix) F | x) T | xi) F | |

Q.16 Choose the correct answer

- | | | | | |
|------|-------|--------|-------|------|
| i) D | ii) C | iii) B | iv) B | v) D |
|------|-------|--------|-------|------|

- 1) Microcomputers have basic components.
(a) Three (b) Two (c) Four (d) One
- 2) Is the most commonly used input device.
(a) Mouse (b) Joystick (c) Keyboard (d) Speaker
- 3) Keyboard and mouse are examples of devices.
(a) Input Devices (b) Output Devices (c) Control Devices (d) Storage
- 4) Printers & Monitor are examples of devices.
(a) Input Devices (b) Output Devices (c) Control Devices (d) Storage
- 5) The backbone of the computer is.
(a) Computer Bus (b) Control Panel (c) Computer Ports (d) CPU
- 6) The unit inside the CPU that controls the execution of instructions given to the computer is called.
(a) Control Unit (b) Memory Unit (c) ALU (d) Buses
- 7) The input / output operations of the CPU are controlled by the.
(a) Control Unit (b) ALU (c) MU (d) None
- 8) ALU consists of section.
(a) Two (b) Control (c) Memory (d) One
- 9) Arithmetic operations in the ALU are performed by Section.
(a) Arithmetic (b) Control (c) Memory (d) MU
- 10) Section of the ALU performs logical operation.
(a) Control (b) Memory (c) Logical (d) None
- 11) The computer bus that carries data is called.
(a) Data Bus (b) Address Bus (c) Control Bus (d) All
- 12) Bus is used to transfer data from one device to another device in the computer.
(a) Data Bus (b) Address Bus (c) Control Bus (d) None
- 13) ALU performs.
(a) Arithmetic Function (b) Control Function
(c) Both a & b (d) None
- 14) CPU stands for.
(a) Central Processing Unit (b) Control Panel Unit
(c) Control Processing Unit (d) Central Power Unit
- 15) EDP stands for.
(a) Electronic data Projector (b) Electronic Data Processing
(c) Electronic Data Projection (d) None
- 16) In the computer generates electrical pulses.
(a) Computer Bus (b) Computer Clock (c) Computer Ports (d) All
- 17) Controls and supervises all the units of a computer,
(a) CPU (b) ALU (c) CU (d) MU
- 18) Addition, subtraction is done by the.
(a) CPU (b) ALU (c) CU (d) MU
- 19) Logical operations are done by the.
(a) CPU (b) ALU (c) CU (d) MU
- 20) Is like the traffic policeman.
(a) CPU (b) ALU (c) CU (d) MU
- 21) The physical components of a computer are called.
(a) Hardware (b) Software (c) Firmware (d) Shareware